

## Appendix C – Program Cost and Productivity Basis

### Mains + Restoration, No Intersections

Material Factor - Pipe: 7% of average sub-total - by pipe size

Category	Install or restore	Main Installation Pricing - LF of open cut*								
		2" Pipe			4" Pipe			6" Pipe		
		Road	Parkway	Alley	Road	Parkway	Alley	Road	Parkway	Alley
Labor/Equip	Install	\$17.50	\$17.50	\$17.50	\$20.00	\$20.00	\$20.00	\$29.50	\$29.50	\$29.50
Sand Backfill and Disposal	Install	\$11.50	\$17.00	\$11.50	\$11.50	\$17.00	\$11.50	\$11.50	\$17.00	\$11.50
Pavement Removal	Restoration	\$38.00	\$0.00	\$38.00	\$38.00	\$0.00	\$38.00	\$38.00	\$0.00	\$38.00
8" Alley Replacement	Restoration	\$0.00	\$0.00	\$244.50	\$0.00	\$0.00	\$244.50	\$0.00	\$0.00	\$244.50
12" Base	Restoration	\$61.50	\$0.00	\$0.00	\$61.50	\$0.00	\$0.00	\$61.50	\$0.00	\$0.00
Grinding & Resurfacing	Restoration	\$105.00	\$0.00	\$0.00	\$105.00	\$0.00	\$0.00	\$94.50	\$0.00	\$0.00
Topsoil	Restoration	\$0.00	\$6.00	\$0.00	\$0.00	\$6.00	\$0.00	\$0.00	\$6.00	\$0.00
Sod	Restoration	\$0.00	\$5.00	\$0.00	\$0.00	\$5.00	\$0.00	\$0.00	\$5.00	\$0.00
Sub Total		\$233.50	\$45.50	\$311.50	\$236.00	\$48.00	\$314.00	\$235.00	\$57.50	\$323.50
Pipe		\$14.00	\$14.00	\$14.00	\$14.00	\$14.00	\$14.00	\$14.50	\$14.50	\$14.50
Total		\$247.50	\$59.50	\$325.50	\$250.00	\$62.00	\$328.00	\$249.50	\$72.00	\$338.00

Category	Install or restore	Main Installation Pricing - LF of open cut								
		8" Pipe			12" Pipe			>12" Pipe		
		Road	Parkway	Alley	Road	Parkway	Alley	Road	Parkway	6" Alley
Labor/Equip	Install	\$40.50	\$38.50	\$38.50	\$54.00	\$54.00	\$54.00	\$69.50	\$69.50	\$69.50
Sand Backfill and Disposal	Install	\$14.50	\$17.00	\$11.50	\$17.00	\$25.50	\$11.50	\$17.00	\$25.50	\$11.50
Pavement Removal	Restoration	\$42.50	\$0.00	\$38.00	\$47.50	\$0.00	\$38.00	\$47.50	\$0.00	\$38.00
8" Alley Replacement	Restoration	\$0.00	\$0.00	\$244.50	\$0.00	\$0.00	\$244.50	\$0.00	\$0.00	\$244.50
12" Base	Restoration	\$69.00	\$0.00	\$0.00	\$76.50	\$0.00	\$0.00	\$76.50	\$0.00	\$0.00
Grinding & Resurfacing	Restoration	\$97.50	\$0.00	\$0.00	\$90.00	\$0.00	\$0.00	\$90.00	\$0.00	\$0.00
Topsoil	Restoration	\$0.00	\$6.00	\$0.00	\$0.00	\$8.00	\$0.00	\$0.00	\$8.00	\$0.00
Sod	Restoration	\$0.00	\$5.00	\$0.00	\$0.00	\$6.50	\$0.00	\$0.00	\$6.50	\$0.00
Sub Total		\$264.00	\$66.50	\$332.50	\$285.00	\$94.00	\$348.00	\$300.50	\$109.50	\$363.50
Pipe		\$15.50	\$15.50	\$15.50	\$17.00	\$17.00	\$17.00	\$18.00	\$18.00	\$18.00
Total		\$279.50	\$82.00	\$348.00	\$302.00	\$111.00	\$365.00	\$318.50	\$127.50	\$381.50

Source – PTD rates \*CBD rates = ((Subtotal x 52%) x 2.0) + (Subtotal x 48%). This equates to double time labor plus material

## Services + Restoration

Material Factor - Pipe: 7% of average sub-total - by method

Category	Install or restore	Service Install - Per LF		
		5/8" - 1 1/4" Pipe		
		Direct Bore		Open Cut*
Labor/Equip	Install	\$26.50		\$17.50
Sand Backfill and Disposal	Restoration	\$14.50		\$56.50
Sidewalk	Restoration	\$3.00		\$17.00
Top Soil	Restoration	\$1.00		\$2.00
Sod	Restoration	\$0.50		\$2.00
Post Install Insp.	Install	\$5.50		\$5.00
Sub Total		\$51.00		\$100.00
Pipe		\$14.00		\$14.00
Total		\$65.00		\$114.00

Source – PTD rates \* assume 2" sidewalk open cut numbers

## Intersection Restoration

Category / Unit	Install or restore	Service Install - Per LF					
		Full Intersection			T Intersection		
			Price	Total	Qty	Price	Total
Labor/Equip (sf)	Restoration	3,448	\$4.50	\$15,516	2,780	\$4.50	\$12,510
Pavement Removal (sf)	Restoration	3,448	\$2.50	\$8,620	2,780	\$2.50	\$6,950
Grind / Resurface (sf)	Restoration	3,448	\$0.50	\$1,724	2,780	\$0.50	\$1,390
Handicap Ramps (ea)	Restoration	8	\$8,500	\$68,000	6	\$8,500	\$51,000
Total			\$7.50	\$93,860		\$7.50	\$71,850

Source – PTD rates

## Permits

Permit	Annual Escalation	Per opening	Asphalt Restoration Fee	Moratorium Degradation Costs*		
				Permit	0-2	2-5
Street / Alley	5%	\$432	Applicant must restore	\$864	\$5,000	\$2,500
Sidewalk	5%	\$432	No Charge	\$864	\$5,000	\$2,500
Parkway	5%	\$215	No Charge	\$430	\$5,000	\$2,500
ADA ramp Installation	5%	\$432	No Charge	\$864	\$5,000	\$2,500

Source: CDOT 2014 Permit Fee Schedule

\* Depends of formula

## Productivity / Cost Parameter Basis

### Engineering

No Source

Install Miles	Productivity Miles/ Week	Cost Basis*
<2	0.50	8.0%
2-5	0.75	6.0%
5-8	1.00	5.0%
>8	1.25	4.5%

\*as a percentage of mains and services construction costs

### Main Installation

2012-2014 Program-to-Date Information

Roadway Install %	Productivity Miles/ Week / Crew
<35%	0.7 - 0.1
35%	0.1 - 0.11
>35%	0.1 – 0.25

Crew Assignments based on miles/neighborhood

>30 miles – 15 installation crews

10-30 miles – 9 installation crews

<10 miles – 6 installation crews

### Estimated split of Contractor and PGL work

Provider	Mains	Services	Meters
Contractors	89%	84%	0%
PGL / Company	11%	16%	100%
Total	100%	100%	100%

Source - 2014 Liberty Audit, Data Request (DR) 224h. Based on dollars.

### Installation crew make-up

Craft Labor (FTEs)	Mains	Services	Meters
Operating Engineers	1	1	0
Laborers	2	2	0
Pipefitters	7	7	0
Gas workers	0	0	2
Total Crew Size	10	10	2

Source – Program Management Office Construction

### **Service Installation**

2012-2014 Program-to-Date Information

Shop	Productivity Services/ Week
Central	65
North	100
South	75

### **Intersection Installation**

No Source

40 intersections / week (1,600/year for 40 weeks of construction season)

### **Meters**

PTD Information - 2013

Meter Location	Sub-Location	Dwelling Size	Meter Size	Productivity (days/meter)		
				Facility Age		
				>1981	40 - '80	<1940
Outside	N/A	N/A	Small	0.17	0.17	0.17
Outside	N/A	N/A	Medium	0.20	0.20	0.20
Outside	N/A	N/A	Large	0.25	0.25	0.25
Inside	Unfin Base <sup>a</sup>	Single	Small	0.18	0.23	0.25
Inside	Unfin Base	Single	Medium	0.20	0.25	0.27
Inside	Unfin Base	Single	Large	0.25	0.32	0.33
Inside	Fin Base <sup>b</sup>	Single	Small	0.36	0.45	0.50
Inside	Fin Base	Single	Medium	0.40	0.50	0.53
Inside	Fin Base	Single	Large	0.50	0.63	0.67
Inside	Other	Single	Small	2.00	2.50	2.63
Inside	Other	Single	Medium	2.00	2.50	2.63
Inside	Other	Single	Large	3.30	4.20	4.30
Inside	Unfin Base	Multi	Small	0.18	0.23	0.25
Inside	Unfin Base	Multi	Medium	0.20	0.25	0.27
Inside	Unfin Base	Multi	Large	0.25	0.32	0.33
Inside	Fin Base	Multi	Small	0.36	0.45	0.50
Inside	Fin Base	Multi	Medium	0.40	0.50	0.53
Inside	Fin Base	Multi	Large	0.50	0.63	0.67
Inside	Other	Multi	Small	2.00	2.50	2.63
Inside	Other	Multi	Medium	2.00	2.50	2.63
Inside	Other	Multi	Large	3.30	4.20	4.30

*a – unfinished basement*

*b – finished basement*

**Appendix D – Program Estimate**